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EIGHTY THOUSAND INFORMATION SYSTEMS: THE UTILIZATION OF COMPUTING IN AMERICAN LOCAL GOVERNMENTS

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Abstract—Computer use in American local governments is as varied as the governments that employ it. Nevertheless, important similarities exist across local governments. Seven distinct characteristics of American local governments seem to account for these similarities in computer use, explaining for example its limited use and fragmented quality—both within local governments as well as between them. These characteristics include the poverty, autonomy, geographical dispersion, structural fragmentation, limited role, pluralism, and split political culture of American local governments as compared with other organizations both here and abroad.

INTRODUCTION

OVER 80,000 independent jurisdictions form the fabric of American local governments. These include various municipalities such as cities, towns, and villages, as well as counties, school districts, and other special districts that handle a broad array of services from street lighting to public libraries to water treatment [1]. Computer use varies widely across these jurisdictions, from jurisdictions approaching images of the clerical army to those approaching the automated office of the future; from jurisdictions that have managed computing well to others that have managed million dollar blunders.

Given these extremes and all the variations between them, no one can describe computing in American local governments through experience with only one or two cities. Furthermore, despite a history of observation†, the most recent survey data available on this topic is dated by more than five years, having been gathered from city and county officials in 1975. Also, the results of this survey have been well described, analyzed, and reviewed in numerous books and journals‡. There have been systematic studies of local government information systems since the 1975 survey. However, they have been limited to far less representative surveys and case studies, often focused on specific kinds of information systems§.

One shortcoming of the growing literature on local government computing is that observation has focused almost exclusively on identifying and explaining differences between local governments, despite marked similarities. Although variations across local governments are extensive, they are bounded by important similarities. Some of the most notable similarities are that local government computing is generally: under-financed and under-staffed; nonstandardized even though overlapping across jurisdictions; dependent on regional communication networks; characterized by multiple and fragmented rather than integrated information systems; oriented toward administrative support and social control; governed by a pluralistic decision-making process; and troubled by a split political culture.

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† Early studies of computing in American local governments are those reported in Hearle and Mason [2] and Kraemer [3].

‡ This was the URBIS (Urban Information Systems) Project survey conducted by the Public Policy Research Organization at UC Irvine. Individual city and county profiles of the survey responses are presented in Kraemer, Matthews, Dutton and Hackathorn [4], and Matthews, Kraemer, Hackathorn and Dutton [5]. Descriptive overviews of the survey results have been provided by Danziger, Kraemer and King [6], Kraemer and King (1977a, 1977b, 1978, [7, 8, 9], Kraemer, Dutton and Matthews [10], Matthews, Dutton and Kraemer [11], URBIS Group (1977) [12]. The most comprehensive analytical treatments of this survey data are provided by Kraemer, Dutton and Northrop [13], and Danziger, Dutton, Kling and Kraemer [14].

§ Several case studies and a survey of city computing recently have been completed as part of the Fiscal Impact Budgeting System (FIBS) project, supported by a grant from the National Science Foundation. However, the FIBS survey is focused on cities using sophisticated, computer-based fiscal impact models and is, therefore, nonrepresentative of U.S. cities. Early results of this study are reported in Dutton [15] and Dutton and Kraemer [16].

Although the state of the art of local government computing is constantly evolving, in many fundamental respects the same general patterns that characterized it in 1975 govern local computing in 1981. This, it is argued, is because computer technology is shaped by the particular organizational settings of its use. Given the importance of such organizational settings, the major aim of this article is to identify seven characteristics of American local government settings that seem to affect the use of computer technology and to explain these broad similarities across local governments.

THE DYNAMIC NATURE OF COMPUTING

Given the rapid development of computer and telecommunication technologies during the 1970s, a common question is: How has local government computing been changed by these developments? Local government computing has been changing rapidly since computing was introduced in the 1950s. Some indication of this dynamism can be inferred from the steady and rapid rate at which computing has been adopted by cities and counties. For example, in the span of 20 years since computing was first adopted by the largest cities, over 82% of all U.S. cities with populations over 50,000 have adopted the technology [14]. With the exception of the smallest jurisdictions, nearly every U.S. city now utilizes computing. Moreover, the rapid advance of mini-computer and micro-computer technology has made the small jurisdictions a prime market for the 1980s, and submerged within statistics are the continuing expansions and enhancements of each local government's package of computing equipment, people, and techniques. Given historical patterns of adoption, the late 1970s can likely be characterized by the adoption of computing by smaller city and county governments and an increasing number of both larger and smaller computers in the larger city and county governments.

The dynamism of the computing environment can be inferred as well from the extent of actual and planned change in local government computing arrangements in 1975 (Table 1). Table 1 presents survey data gathered from city and county data processing managers in 1975. The table illustrates various changes in the arrangements of service provision over 2 years (1973 and 1974), and the changes anticipated for the subsequent year. In the short span of 2 years, fully 20% of the local governments significantly increased the core size of their mainframe computers. Nearly 40% of the managers reported a fundamental change or upgrading of the generation of their CPU, and almost 20% planned such an upgrading during 1975. Moreover, more than 30% of the governments changed the management of the computing unit, more than 20% altered the departmental status of the computing center, and nearly 25% changed the physical location of the computing installation. This rate of change is substantial. During only 3 years, between one-third and two-thirds of the cities and counties are involved in each of a series of substantial changes in the provision of computing services. Other data indicates that although local governments had an average of 30 computer applications in 1975, the data processing managers expected this to double within the next 2 years and certainly to double before 1980 [14, Chapter 2].

However, the changes that appear to have actually taken place since 1975 are less dramatic than many expected and hoped for. For example, local governments by and large have not remade themselves in the image of the automated local government (office) of the future. Although many trade journals and commercial advertisements portray this image as increasingly common, it is rare among local governments. As yet, computer and telecommunication technologies have not converged to revolutionize the organization of work in local government. For example, many local governments have adopted or extended their use of word processing equipment, but generally have not moved to distribute word processing and electronic messaging systems. Communications and data processing continue to be separate departments and separate activities. Most broadly, the available evidence suggests that computing in American local governments

Table 1. Percent of U.S. cities and counties changing in EDP arrangements†

	Percent of governments indicating a change								
	CPU size	Development priorities	Generation of machine	EDP management	Physical location	Department status	Main-frame vendor	Installation relations	Number of CPUs
Cities									
Change over last two years (1973–1974)	57	42	40	31	21	22	17	12	10
Change planned over next near (1975)	...	24	17	6	14	11	8	7	8
Counties									
Change over last two years (1973–1974)	64	64	38	31	26	23	15	13	8
Change planned over next year (1975)	...	25	18	4	23	13	4	11	7

Leaders (...) indicate not reported.
† Adopted from URBIS Group [12] (Table 3).

of the 1980s looks very much like that of the 1970s [14]. Change has seen steady, incremental growth in the sophistication and application of computing. However, there is no indication that actual growth has approached the optimistic plans of data processing managers in 1975.

Given the rapidly developing state of the art in technology, its application by local governments will continue to be less integrated, sophisticated, and extensively applied than the technology dictates. In the case of local governments, technological trends often seem less influential in directing the course of computing than do social, economic, and political trends, and, as computing and telecommunication technologies continue to become less costly and more sophisticated, their application is likely to become governed more by the cultural, economic, and political setting than by technological limitations. Increasingly, the technology can do anything organizations wish it to do.

THE IMPORTANCE OF ORGANIZATIONAL CONSTRAINTS

Several streams of research are converging on the thesis that the use of computer technology is shaped dramatically by its organizational context†. The cultural, socio-economic, and political characteristics of organizations tend to direct decisions regarding the adoption and application of computer technologies. If computer-based information systems are reflections of the organizations that use them, then more attention should be focused on such organizational constraints. To understand the state of the art of computing in American local governments requires one to understand their nature.

There is also a growing body of research that identifies the features of the organizational environment that are most critical to the shape of computing [14]. Several categories of constraints are the national, regional, and community environment and the political–administrative system of the local government. However, this research is limited generally to "within-system comparisons", such as comparing local governments within the U.S., rather than extending to a cross-national basis‡. Thus, system level similarities across units within the system tend to be ignored. That is, social analyses of computing in local government have focused far more on explaining differences across cities within a particular country, such as the U.S., than in identifying and explaining similarities. However, computing in U.S. cities and counties has certain common features that were noted above. For example, computer systems tend to be highly fragmented rather than integrated across departments and applications.

This may be so because there are certain common characteristics of American local governments that shape the utilization of computing. In order to suggest features and to speculate on their effects, it is necessary to simplify. There are wide variations among the 80,000 local governments in the U.S., and there is little empirical evidence to support most of the speculations. Notwithstanding these limitations, positing these characteristics might generate the discussion necessary in developing more systematically grounded generalizations.

Seven characteristics of American local governments

There seem to be at least seven broad characteristics of American local governments that have shaped the state of the art of urban information systems. These features of American local governments are their:

1. Poverty
2. Autonomy
3. Geographical dispersion
4. Structural fragmentation

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† Several overviews of the computers and society literature have noted this theme [17, 18]. Studies that provide support for this generalization include Danziger and Dutton [19], Danziger, Dutton, Kling and Kraemer [14], Dutton and Kraemer [20, 16], Laudon [21], and Kraemer and Dutton [22].

‡ One exception is the work of Kenneth Kraemer and John Leslie King that compares computing in a variety of European and American communities.

5. Limited role
6. Pluralism
7. Split political culture

Poverty. The first but nonobvious characteristic of the American social-organizational setting concerns the economic constraints of local governments. The economic vitality of organizations has been linked frequently to the adoption and use of technological innovations such as computing [19]. This is no less the case in local government computing where American local governments are relatively poor, despite the fact that they serve the citizens of one of the wealthiest nations in the world. Some have referred to this feature as the "irony of urban wealth" [23]. This irony exists because local government revenues have been restricted by a historical reliance on property taxes, state and federal government control of more lucrative tax sources such as sales and income taxes, state limitations on local government taxing policies, tax competition among neighboring local jurisdictions for new residents and industry, and the attitudes of residents. These public attitudes have surfaced most recently in citizen support for a series of tax limitation measures, such as California's Jarvis–Gann Property Tax Limitation Initiative. Together, these factors have severely restricted the ability of American local governments to tap the wealth of their jurisdictions.

This irony of urban wealth is important to the financial support of computing. In one respect, as fiscal stresses and strains became more serious for American local governments during the 1970s, many promoted computer-based systems as an approach to lowering the costs and increasing the efficiency of urban services. However, some of the very systems that have the most promising impacts on local government revenue and expenditure balances have failed to be widely adopted [15]. In most cases, governments must invest money in the hope of saving money, but when slack budgetary resources are unavailable, this is done less commonly.

Also, there are opposing forces. First, in an area of budget cutbacks and limitations, computing budget increases must come, at least initially, from other budgets. In the fierce competition for resources, computing has not fared well. Historical data on computing expenditures suggests that computing budgets have tended to absorb about 1 to 2% of

Table 2. U.S. city and county computing expenditures, 1975, by population†

Classification	Total governments reporting (*N*)	Average government operating budget in current fiscal year (in thousands) ($)	Average budgeted expenditures for data processing installation(s) (in thousands) ($)	Average computing expenditure as a % of total operating budget
Total, all cities	997	21,846	193	0.9
Population group‡				
500,000 and over	20	334,870	3596	1.2
250,000–499,999	24	107,855	1108	1.1
100,000–249,999	74	50,215	474	1.1
50,000–99,999	190	19,625	157	1.0
25,000–49,999	266	10,648	66	0.6
10,000–24,999	423	5243	28	0.5
Total, all counties	412	36,587	487	1.2
Population group				
500,000 and over	48	195,386	2708	1.8
250,000–499,999	51	48,309	811	1.8
100,000–249,999	117	22,641	292	1.6
50,000–99,999	75	11,517	76	0.6
25,000–49,999	58	9205	42	0.5
10,000–24,999	63	3868	25	0.6

† Adapted from Danziger, Kraemer and King [6] (Table 4).

‡ These figures are probably underestimates due to incomplete responses from some of the multiple installations in these cities.

Table 3. Selected characteristics of computing equipment and applications for U.S. cities and counties, by population†

Classification	No. of governments reporting	Average number of CPUs	Average total core capacity in bytes (K)	Median total core capacity (K)	Average number of CRT terminals	Average number of automated applications currently operational
Total, all cities	647	1.2	155	94	9	17
Population group						
500,000 and over	20	4.0	1986	1536	72	65
250,000–499,999	28	2.1	531	328	19	41
100,000–249,999	79	1.4	227	144	6	38
50,000–99,999	178	1.1	89	32	2	23
25,000–49,999	174	1.1	54	22	. . .	6
10,000–24,999	184	1.0	27	16	. . .	5
Total, all counties	277	1.4	296	156	14	23
Population group						
500,000 and over	39	2.6	1246	640	40	47
250,000–499,999	53	1.5	321	196	15	36
100,000–249,999	98	1.3	133	64	4	24
50,000–99,999	47	1.1	57	24	. . .	5
25,000–49,999	32	1.0	48	24	. . .	4
10,000–25,999	12	1.0	36	16	. . .	4

Leaders (. . .) indicate not reported.
† Adopted from URBIS Group [12] (Table 5).

local government budgets (Table 2). Both general and computing budgets expanded rapidly during the 1960s, but both budget increases slowed in the 1970s. In some cases, local government budgets now actually are being reduced. Politically, it is easier to cut taxes, or reduce programs, than it is to spend additional money on computing systems that guarantee no cost savings.

In short, the development of computing has been restricted by the relative poverty amid plenty of most local governments. Typically, local government computing is under-financed and under-staffed. In fact, the failure of most local governments to employ advanced equipment, personnel, and techniques was found to be a major explanation for

Table 4. Computing personnel in U.S. cities and counties, by population†

	Computing departments			User departments	
Classification	Total number personnel (A)	Percentage analysts and programmers (% of A)	Personnel as a % of total government employees	Total number computing staff (B)	Percentage analysts and programmers† (% of B)
Cities					
Mean, all cities	22.0	24	1.0	5.9	36
Population group‡					
500,000 and over	112.5	24	0.8	30.1	45
250,000–499,999	39.2	30	0.9	11.7	25
100,000–249,999	19.6	29	1.0	5.8	32
50,000–99,999	7.6	21	1.1	1.2	25
Counties					
Mean, all counties	37.8	26	0.3	10.2	27
Population group					
500,000 and over	95.6	27	0.3	24.9	19
250,000–499,999	29.6	34	0.3	9.5	41
100,000–249,999	14.3	23	0.4	3.4	35
Mean, all cities and counties	28.0	25	0.7	7.6	30

† Adopted from URBIS Groups [12] (Table 6).
‡ These figures are low estimates due to incomplete responses.

poor computing performance [13]. Most local governments must rely on one medium-sized business computer and a small computing staff (Tables 3 and 4). These continuing limitations on local government revenue sources will severely limit the speed at which local governments can improve the performance of automated services, much less move toward the automated office, management information or decision support systems, and other state-of-the-art applications of computer technology.

Autonomy. The most obvious characteristic of the American system is its federal structure as opposed to the more unitary intergovernmental structure of such countries as England or Japan or the more centralized Napoleonic system of France. The U.S. brand of federalism is sometimes figuratively described as a "marble cake" because intergovernmental relationships vary so radically from the conventional hierarchical or "layered cake" pattern. This marble cake federalism imposes several interesting constraints on urban information systems. Two seem most fundamental. First, the relative autonomy of local governments means that few local governments look alike. They develop more or less unique departmental structures, job classifications, budgeting and accounting systems, etc. Second, nearly every governmental function, including land use control, welfare, or police services, is provided through the mutual interdependence and interaction of multiple and sometimes competing federal, state, and local government agencies. These intergovernmental dependencies change over time, across jurisdictions, and across issues.

These two features of American federalism make the development and transfer of automated information systems for local governments exceedingly complex. Systems must be tailor-made in most cases to fit the unique attributes of each government's operations. They therefore tend to be a cumulative product of incremental adjustments made over years of manual and automated operation. Because of this evolutionary pattern of application development, a budgeting system built for Cleveland, Ohio, is unlikely to meet the needs of Toledo, Ohio, and most certainly not Tulsa, Oklahoma. Variations across states and even across municipalities of the same class within the same state can be major.

Given this variation, local government officials hold a common view that their city is unique. In many important respects, they are correct. The major effects of this uniqueness seem to be raising the complexity of system development and transfer; and this complexity is accentuated by the many overlapping responsibilities of multiple jurisdictions. For example, a recent case study of decision making surrounding a new land development in San Diego, California, identified at least 17 different state and local government agencies involved in analyses of project plans and impacts [16]. Such fragmentation of authority, responsibility, and information among multiple jurisdictions supports the proliferation of often incompatible information systems. Also, competition among these jurisdictions undermines the incentive for many multiple jurisdictions to integrate their information systems. For example, Kling's [24] case study of an attempt to develop an integrated social service client tracking system for a community illustrates how the organizational maintenance and enhancement needs of different jurisdictions work against their cooperation on systems that might benefit each organization.

Geographical dispersion. The United States is a nation of about 218 million people. It has twice the population of Japan (105 million), but covers 3.6 million square miles, over 25 times the land area of Japan. In fact, Japan occupies less land area than the State of California. This geographical dispersion of the over 80,000 American local governments seems related importantly to the diversity of information systems. American geography fosters regional rather than national communication networks for the diffusion of innovations. Whereas such organizations as the International City Management Association, Public Technology, Inc., and the Department of Housing and Urban Development have initiated nation-wide campaigns focused on the development and diffusion of urban information systems, most local government officials rely on regional organizations and regional communication networks such as that of the Southern California Association of Municipal Data Processing Managers. Not surprisingly, research on the adoption of computing in American local governments has found some evidence to support the importance of regional networks for the diffusion of innovations [19]. As a consequence, there are marked regional differences in the extent and character of computing arrangements†. For example, cities of the South and West have generally made greater investments in more modern computer systems than their counterparts in the North and East.

Structural fragmentation. In a major respect, the title of this paper, "80,000 Information Systems", is misleading. Only in the broadest sense of the world "system" could local governments be considered to have a single information system. In fact, the very opposite characterizes most local governments. One of the major findings emerging from empirical research on local government computing is the highly fragmented, non-integrated structure of urban information systems [20]. Because the average local government had about 30 operational computer applications in 1975, this article might easily have been entitled "30 × 80,000 = 2,400,000 Information Systems". This exaggerates the extent of computing in the smallest cities, counties, and special districts, but the message is clear; urban information systems are highly fragmented. In this respect, they mirror the organizational charts of local governments.

During the colonial era in the U.S., authority was highly centralized in the state governors and legislators who appointed most important local government officials. The landed social and economic elites governed communities largely through their control of the state legislatures [25]. In reaction to this aristocratic elite dominance, a variety of democratic reforms were instituted to decentralize (fragment) authority and make local government officials more accountable to the local community. The legacy of these populist reforms is the weak mayor form of government, still used by many American cities, and the elected Board of Supervisors form of government, which governs most U.S. counties. Both create a number of independently elected officials and work to fragment authority into a number of semi-autonomous fiefdoms. Since the 1920s and 1930s, the urban reform movement has sought to recentralize authority within jurisdictions under a strong chief executive such as a mayor or city manager, across jurisdictions through regional governments, and across levels through increasing federal control.

However, structural fragmentation still dominates the organization of most local governments not only because of this history of democratic reforms but also because of the strategic interests of line agencies [26]. All line functions such as libraries, parks, and police have somewhat different clients and constituencies. Thus, such functional departments develop relatively independent bases of power and authority [23, 26]. Some have called the functional departments and agencies the "new machines" of American local governments, harkening back to the days when such politicians as William Marcy Tweed, Oakey Hall, "Slippery Dick" Connolly, and Peter Barr "$weeny" controlled city halls and state legislatures through their use of the political party machinery [27].

Limited role. An early, classic study of American local politics developed a typology of local political values that characterizes four different roles of local government: "(1) promoting economic growth; (2) providing or securing life's amenities; (3) maintaining (only) traditional services; (4) arbitrating among conflicting interests" [28, p. 23]. These are ideal types and cities might be classified by how closely they approach each type.

Two broad observations may be made about this typology. First, only one type, the Type 2 city, is predominately oriented to providing services. In other words, most of these types suggest a passive, reactive role of local governments. Second, it appears that only a small proportion of American local governments approach Type 2. In short, local governments in the United States are not oriented primarily toward providing physical, social, or economic amenities through services.

Consistent with this value orientation, the role of computing in American local governments is not that of service delivery. For the most part, computer applications in cities and counties are oriented toward administrative functions and social control and not toward social services. For example, the most commonly automated applications in American cities (over 50,000 in population) support administrative operations and include accounting, treasury and collection, budgeting and management, personnel, utility billing, purchasing, and inventory control [14]. The only other functional area in cities that is as commonly automated is police protection, which is better classified as social control or maintaining traditional services as opposed to providing direct service or amenities. Similarly, the most common automated applications in U.S. counties (over 100,000 in population) are accounting, treasury and collection, assessment, voter registration, and courts (docketing and scheduling). Again, computing supports administration and social control. Some of the least commonly automated are public welfare, health, hospital, park, recreation, and library applications, which are relatively more service oriented. This seems to be a reflection of the dominant preferences of community residents about the proper role of local government [14, Chapter 8]. Computer use generally follows and reinforces these value orientations of local governments.

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† Regional differences in economic vitality confound any simple interpretation of the role of regional communication networks.

Pluralism. With some notable exceptions, most studies of the policy-making process in urban communities and bureaucracies of the U.S. have supported a pluralistic model of influence [25, 29]. Pluralism has been variously defined since Robert Dahl's [25] seminal work on the topic. However, the concept normally entails the notion that (a) no one groups dominates all policy issue areas, (b) no single resource such as money, votes, or information dominates all other resources, and (c) decisions are made through a process of bargaining and negotiation among a variety of participants representing different groups or interests.

Likewise, this pluralism tends to characterize the bureaucratic politics governing computing resources in local governments [14, 21]. For example, Table 5 presents the perceptions of data processing managers regarding who controls six critical kinds of computing decisions. Broadly, their perceptions fit other data supporting a pluralistic environment. A variety of participants can have some influence on some computing decisions, but no one group or participant controls most decisions.

The split political culture of Americans. Political culture refers broadly to the dominant attitudes, beliefs, and values of the general public. Many Americans seem to place great faith in two sometimes contradictory values. The most basic value is a diffuse support for the abstract tenets of democracy. One of the most seminal comparative studies of national political cultures labelled this broad support for democratic values "the civic culture" [30]. For instance, in general, the American public supports such abstract principles of democratic governance as freedom of speech, the right to vote, and the freedom of assembly. However, as later studies have pointed out, the same people might not support these same principles in concrete circumstances. For example, people might not believe a particular extremist group should have the right to speak at their neighborhood school. The flip side of this democratic civic culture is an anti-bureaucratic, anti-government, anti-planning populism. In several respects, this sentiment encompasses a belief that both organizations and society should be governed by democratic, participatory principles, rather than by any social, economic, or intellectual elite.

Another set of values relates more to technology than governance. Generally, most Americans have an abiding 'faith' in technology; "it taps deep sentiments which are not easily depleted through disappointments with the technology". Yesterday, the assembly line made a fortune for Henry Ford and revolutionized the automobile industry. Today, many believe that robots, computers, and telecommunications are developing a new industry and revolutionizing our new 'information society'.

Americans have a somewhat split political culture in that there seems to be a fundamental tension between a faith in both democracy and technology. In some respects, this is the classic tension between democracy and bureaucracy, or rationality, or most broadly, technology.

However we label this tension, it seems to manifest itself in the social settings of computer use in American local governments. First, local government officials and personnel are very supportive of computing and its extensive use [13]. Yet, the support of

Table 5. Data-processing managers' perceptions of control points over decisions regarding computers and data processing†

		Percentage indicating							
Decision		Chief executive official	Data processing	Dept. head over data processing	User dept.	Local legislature	Inter-dept. board	Inter-governmental board	Other
A.	"Must approve budget requests for new computer mainframes and systems"‡.	33	78	NA	73	15	32	NA	NA
B.	"Must approve requests for new peripheral equipment in user departments"‡.	57	65	48	41	52	10	7	9
C.	"Must approve major reorganizations such as changing the departmental status or location of EDP, or consolidating several independent EDP units"‡.	69	44	46	6	53	9	9	7
D.	"Is primarily responsible for evaluating services provided by this (data processing) installation"§.	12	30	23	21	3	7	4	2
E.	"Provide a major input into whether or not a new set of EDP applications will be adopted"‡.	33	78	NA	73	15	32	NA	NA
F.	"Has authority for setting priorities for the development of new application"§.	18	25	26	3	3	15	5	5

† The following questions were asked of city and county data processing managers (N = 475).

‡ Respondents indicated all applicable categories; therefore, the percentages across will total more than 100%.

§ Respondents were asked to indicate the one best answer.

NA, not ascertained.

Table 6. Involvement of selected municipal officials and personnel in design of computer applications

Selected officials and groups	Percent of officials and group indicating: No involvement in design	Some involvement in design	Total	(*N*)
Elected officials and staff				
Mayor	91	9	100	(11)
Mayor's staff	45	55	100	(20)
Council	74	26	100	(51)
Council staff	67	33	100	(6)
Central administrators and staff				
Chief appointed official	42	58	100	(19)
Appointed official's staff	43	57	100	(53)
Head of balance-reporting unit	6	94	100	(33)
Head of budget-monitoring unit	18	82	100	(28)
Budget analysts	30	79	100	(66)
Accountants	28	72	100	(74)
Departments				
Department heads	29	71	100	(310)
Department administrative assistants	39	61	100	(105)
Division heads	30	70	100	(69)
Department accountants	54	46	100	(69)
Planning				
Planning director	42	68	100	(21)
Planning staff	31	69	100	(16)
Data base custodians and analysts	11	89	100	(63)
Traffic ticket processing				
Directors	20	80	100	(30)
Supervisors	40	60	100	(40)
Clerks	84	16	100	(101)
Police				
Data-processing specialists	17	83	100	(6)
Manpower allocation supervisors	46	54	100	(37)
Manpower allocation analysts	24	76	100	(45)
Records-division clerks	72	28	100	(47)
Detective supervisors	66	34	100	(74)
Detectives	92	8	100	(394)
Patrol officers	94	6	100	(423)
Total	60	40	100	(2176)

Each respondent in the 40-city survey was asked: "Have you worked as a member of a group designing a computer application for your department?".

many officials is contingent on their real or perceived participation, involvement, or consultation in the adoption or design of these computer applications.

Both attitudes become apparent in the behavior of local government personnel officials. They generally have been supportive of the diffusion of computing, and they have been involved to an amazing degree in the design of their computing systems (Table 6). This tension manifests itself in some distrust or suspicion of computer experts and a reluctance to support any computing system imposed by others. Managers of local government computing operations are typically compromising long-range rational plans with short-term user concerns. While user participation might increase the difficulty of expert planning, there are participatory imperatives in the U.S. context as strong as planning imperatives. Managers generally perceive their support to be contingent on balancing these conflicting demands.

CONCLUSION

This article has focused on similarities in computer use among American local governments. Its major theme has been that there are certain critical features of the social-organization setting of American local governments that might account for these similarities. Seven features of this setting that seem particularly relevant are the poverty, autonomy, geographical dispersion, structural fragmentation, limited role, pluralistic decision-making, and split political culture of American local governments. Together, these features might promote an understanding of the limited and fragmented nature of computer use in local governments.

This focus on similarities was meant to complement the bulk of research that identifies and explains variations among organizations of a particular class. For the most part, the demand for systematic and comparable data drives research on computing to the study of differences between insurance companies, state governments, cities, or universities rather than the similarities among insurance companies as compared with local governments in the U.S. as compared to other nations. Basically, current research methods are not well suited to make such comparisons across systems, whether across different kinds of organizations of different kinds of local governments.

However, one can compare findings across systems, organizations, or nations. In this respect, research on computing in American local governments has cumulatively supported the importance of organizational constraints to the use of computer technology. Differences in political-administrative structures across U.S. cities tend to be followed and reinforced by the design and use of computer technology [14]. This more speculative article suggests that certain common features of American local governments are similarly reflected in the nature and use of computer technology to support over 80,000 information systems.

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